

to the liver cells, and allowed autolysis of the tissue, which appears to be the essential liver change, to occur. Some such combination of circumstances might account for the rarity of the disease.

It is evident that a very considerable amount of work from a histological, chemical, and bacteriological standpoint is necessary in the cases already observed. I am indebted for assistance to Mr. P. C. Laws, M.A., in investigating the bacteriology of the cases.

It should be noted that neither clinically nor pathologically do the cases observed bear any close similarity to cases of spirochaetal jaundice.

Professor R. A. Bolam, who has seen some of the cases during life, is engaged with some others on the clinical side of the problem, and we hope in the near future to describe the cases in detail, and to give our conclusions, based on a more thorough study than other pressing work has permitted till now.

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PERICARDIAL KNOCK.

BY

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THERE is a sound heard on auscultation in cases of penetrating wounds of the chest near the cardiac region which is unlike anything met with in civil practice. Its origin is, I believe, not yet established. The occurrence of this sound is now familiar to most of those who are dealing with these cases at the clearing stations. It is of the nature of a click, and varies from a faint sound heard by careful auscultation, to a noise which may be compared to that heard in the ear-piece of a telephone when the lever is moved up and down. It may be heard sometimes when standing at the foot of the patient's bed. Sometimes the patient is conscious of it, and on one occasion has himself called my attention to it. In nearly every case the sound disappears after forty-eight hours, although in one patient who was recovering from a chest wound without any complications the sound persisted for ten days. He was then sent to the base, and I have no further information about him. The sound has been, as a rule, most marked near the apex beat. It is usually double, corresponding to the heart sounds, and its intensity waxes and wanes with respiration, sometimes disappearing completely in full expiration. A distinct fremitus can be felt by the hand laid on the chest.

The first case in which I noted it was shown to me by Captain W. W. Rees, R.A.M.C. I then suggested that it was due to a shell fragment lodged where the pleura and pericardium are in contact. I thought this possible as I had previously heard a metallic rumbling sound in a case in which a shrapnel ball was seen by x-ray screen in the costo-diaphragmatic angle moving up and down with respiration. A skiagram in Captain Rees's case showed the fragment to be in the neighbourhood of the pericardium.

That this explanation was not the correct one was proved by the case of an officer shown to me by Lieut.-Colonel Newlands of the A.A.M.C. The characteristic sound could be heard when standing beside the patient's bed. The entry wound was outside the heart on the left side, and the track passed in the direction of the pericardium. Two days later a right-sided subphrenic abscess developed and was drained. The foreign body was found lying in the right side of the abscess cavity. An infected haemothorax was also drained. The patient died a few hours later, and at the autopsy a "shaggy" purulent pericarditis was present. This case showed clearly that the foreign body was not itself directly responsible for the sound.

In the next case I saw the foreign body was visible on the screen in the cardiac area. It moved continuously

with the heart beat, so that a skiagram showed only a blurred image. This patient died, and at the autopsy the pericardial surface was normal. There was no infection, exudate, or any sign of pericarditis. The cavity contained a few drops of blood-tinged serum due to the passage of the missile, which had traversed the pericardium and lodged in the interventricular septum. This case, as also several others in which the "knock" disappeared after twenty-four or forty-eight hours in patients who never had serious symptoms, shows that pericarditis is not the cause.

I may note in passing that the continuous movement of the foreign body shadow with the heart beat, as distinguished from an oscillatory movement at certain phases of the respiratory and cardiac rhythm, has indicated that the foreign body is actually in the heart wall or cavity.

It has been suggested that the sound is due to emphysema of the connective tissue of the mediastinum, but in one case the missile passed through the chest antero-posteriorly on the left side clear of the upper and outer margin of the heart. Moreover, a case has been reported by Captain Rees in which the sound was heard over the apex beat, which was normal in position. It was heard in systole and was loudest in full inspiration. The foreign body was seen on the x-ray screen moving with respiration, and in full inspiration there was an oscillatory movement communicated to it by the cardiac impulse. There was a clear space of some 2 in. between the heart shadow and that of the foreign body. The entry wound was over the lower end of the left scapula. Localization of the foreign body on anatomical cross-sections showed it to be lying behind the root of the left lung in close proximity to the rami bronchiales, and over 1 in. from the nearest point on the pericardium. The man's condition when he was sent to the base was very good.

The usual disappearance of the sound after a short period, and the absence of serious symptoms in many cases, suggests that it may be due to air in the interstitial connective tissue of the lung which is struck upon by the beats of the heart. Further records will doubtless throw more light on the subject.

A SIMPLE APPARATUS FOR NITROUS OXIDE-OXYGEN ANAESTHESIA.

BY CAPTAIN A. S. WILSON, R.A.M.C.

THE infrequent use of nitrous oxide-oxygen as an anaesthetic for major operations in the British Expeditionary Force would make it appear that its very great advantages have not been fully realized. The rapid induction of anaesthesia and the immediate recovery are most important factors; with any general anaesthetic, the shorter the duration of its influence the better for the patient. Nitrous oxide is shorter than any other.

It is by far the most agreeable anaesthetic to take, and struggling and resistance are uncommon. Post-operative nausea and vomiting are hardly ever encountered; headache, restlessness, and bronchopneumonia are much less frequent sequelae than after ether or chloroform.

With reasonable skill and care on the part of the anaesthetist it is by far the safest general anaesthetic. Cyanosis under nitrous oxide, as under any other anaesthetic, is always a danger signal; when present, it is an indication that an insufficient proportion of oxygen is being supplied; such a mixture will never produce satisfactory relaxation, and usually results in muscular twitching and disturbed respiration. On the other hand, an excess of oxygen causes persistent movement, and prevents the onset of unconsciousness; such excess is frequently indicated by a red flush across the patient's forehead.

Desirable variations in the depth of anaesthesia to suit the requirements of different phases of an operation are much more rapidly and safely attained than with ether or chloroform. It is beyond the scope of this short paper to reiterate Crile's well-known findings on the physiological advantages of nitrous oxide as an anaesthetic.

Even after a prolonged administration, lasting up to two hours or more, the patient always completely recovers from the anaesthetic before leaving the operating table; this is invaluable when the number of post-operative cases is so large that it is impossible to provide a sister or trained orderly to stand by each patient till he is round